



DIVISION OF PLANNING AND PERMITTING
FREDERICK COUNTY, MARYLAND
Department of Permits and Inspections

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Effective May 1, 2021

Frederick County Policy for Emergency Responder Radio Communications Enhancement System (ERRCES)/ Two-way Radio Communications Enhancement System

SCOPE:

1.0 This Policy shall apply to buildings and structures where an ERRCES is being installed or, those buildings which require minimum emergency response communication standards.

PURPOSE:

2.0 The purpose of this policy is to establish the permitting, inspection, and approval process for the installation, modification and/or alteration of an Emergency Responder Radio Communications Enhancement System (ERRCES)/ Two-way Radio Communications Enhancement System within structures and/or buildings under the permitting and inspection jurisdiction of the Frederick County and to allow for the locations of these systems to be noted, maintained and records reviewed pertaining to their maintenance, operation, and capability by Frederick County as required by applicable codes and standards.

DEFINITIONS:

3.0 Emergency Responder Radio Communications Enhancement System (ERRCES)/ Two-way Radio Communications Enhancement System

A system or systems designed and installed to allow for the effective use of two -way radio communication for emergency responders within and /or around a building or structure which may or may not be required by applicable codes and/or standards and may or may not be installed voluntarily. These systems are referred to as Emergency Responder Radio Communications Enhancement System (ERRCES)/ Two-way Radio Communications Enhancement System, Distributed Antenna Systems (DAS), Bi-directional Amplification Systems (BDA), In-building Repeater Systems, Fire Department Communication Systems, Emergency Responder Radio Coverage System , or by any other names not mentioned but, designed and installed for the same or similar purpose and hereinafter called "The System" .

3.1 Department of Permits and Inspection Approval

An inspection approval of The System by a qualified individual, as required by this document, acceptable to the Frederick County Department of Permits and Inspections which states that the system installed has been found to be in compliance with all applicable codes and standards regarding signal and system design, transmission, and system design.

3.2 Department of Permits and Inspections Final Inspection

The inspection and approval of the fire alarm system that is interfaced and interconnected with The System will be performed by the Office of Life Safety personnel to ensure that the system(s) has been installed in accordance with the approved plans, operates, and complies with all applicable codes and standards that are enforced by the Department of Permits and Inspections.

3.3 System Repair

The repair, replacement and/or modification of a fire alarm system and any device or component that is connected to that system will be completed by a certified individual or company approved by the Frederick County Department of Permits and Inspections.

Policy:

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4.0 Where the System is installed modified and/or altered a fire alarm permit, a low voltage permit and an electrical permit shall be obtained from the Frederick County Department of Permits and Inspections prior to any work being done preformed. All plans and specifications under these permits shall be submitted for approval before a permit can be issued. The requirements for The System permit can be obtained from the Frederick County Department of Permits and Inspections.

4.1 The approved plans, specifications, and maintenance and testing records, shall be maintained on site for immediate review throughout the life of the system(s).

4.2 The System shall be permitted for a period of time agreed upon by the Department of Permits and Inspections and the system owner while a fire alarm permit for the emergency replacement is being processed. This will ensure that the two-way radio communications enhancement system is back in operation in the shortest time possible for the protections of all occupants and fire service personnel.

4.3 Where emergency response personnel advise of insufficient radio communications with the Frederick County Emergency Communications Center or other emergency response personnel, or that a two-way radio communication enhancement system is inadequate in a building this policy will be applicable to ensure that a solution to the radio transmission issues are rectified.

4.4 The Division of Fire and Rescue Services of Frederick County and the Frederick County Fire Marshal's Office shall have the responsibility of a general radio survey of an existing buildings during their annual fire inspections of that building. If they find that the radio coverage is inadequate they shall notify the owner of this deficiency and have the owner be responsible for a radio survey to be initiated.

Requirements, Responsibilities, and Regulations

5.0 The following requirements, listings, and regulations shall apply to the installation of The System.

5.1 The system shall meet the code requirements of NFPA 1, NFPA 1221, National Electric Code (NEC), International Building Code (IBC), utilize the UL 2524 Listing to ensure Emergency Response Communication Enhancement System integrity, and Federal Communications Commission (FCC) and applicable requirements of the Frederick County's Emergency Communications Division and as amended by Frederick County Department of Permits and Inspections and subsequent adoption of the above stated codes and regulations.

5.2 The design and acceptance testing of The System shall be performed under the supervision of a Maryland registered professional engineer with a minimum of 5 years of experience in the design, installation, and alignment of these types of systems.

5.3 Radio Signal Survey

5.3.1 A Radio signal survey shall be completed for all buildings newly or under construction to ensure that the building has sufficient emergency radio coverage or if the building has the need for an Emergency Responder Radio Communications Enhancement System (ERRCES). The installation of the system shall meet all Federal Communications Commission (FCC) requirements in addition to requirements herein.

5.3.2 it is the responsibility of the building owner or construction company to have an emergency radio signal communication survey completed to determine the level of radio communications within the building and/or structure. Where the testing indicates a level less than those prescribed by code and/or standard and this document, remedial action shall be taken and approved by the Department of Permits and Inspections prior to final fire alarm system approval.

5.4 The System shall be installed in all new constructed below ground floors of a building, all floors of buildings greater than 25,000 square feet per floor, and all floors of buildings greater than three stories in height. This requirement does not include one and two-family dwellings or town houses.

5.5 The System shall be installed on every floor area in a building that can not achieve the required level of emergency responder radio coverage established within this document and all applicable codes and standards.

5.6 Inspection and Testing of The System.

5.6.1 Response radio coverage and in building radio enhancement system shall be tested, inspected and certified by an approved individual selected by Frederick County Department of Permits and Inspection. The results of the inspection, testing and inspection shall be available to the code official prior to final inspection and occupancy of the building and shall be maintained on site and available for immediate review throughout the life of the system(S).

6.0 Required Level of Radio Coverage

6.1 The required level of radio coverage shall be as follows:

6.1.1 Signal measurement is required to be -95dBm or stronger at any point given point within the building.

6.1.2 Compliance levels of coverage shall be provided throughout not less than 95% of the building unless otherwise noted in the document.

6.1.2.1 Critical areas, including fire command centers, fire pump rooms, exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the AHJ, shall be provided with 99% floor area radio coverage in accordance with adopted addition of NFPA 1221

6.1.3 The system is required to provide coverage at Delivered Audio Quality (DAQ of 3.4 level or higher. DAQ 3.4 is defined as "speech understandable without repetition". Some noise/distortion present". Measurements shall be performed on all frequencies listed for Frederick County emergency communications system.

6.1.4 TESTING (All References to NFPA 1221 and NFPA 72)

Final approval of the building fire alarm system and DAS fire alarm permit will not be granted until a review of the RF coverage data has been reviewed and evaluated by the Department of Permits and Inspections. This information may be provided at the time of final fire alarm inspection to the code official.

The System shall be monitored and signal booster supervisory signals shall include antenna malfunction and signal booster failure. Power supply supervisory signals shall include loss of AC power, failure of battery charger and low-battery capacity, alarming at 70% capacity of battery for each signal booster.

A dedicated monitoring panel shall be provided within the fire command center (or beside the main FACP) to annunciate the status of all signal booster locations. The monitoring panel shall provide visual and labeled indication of the following for *each* signal booster:

- (1) Normal AC power
- (2) Signal booster trouble
- (3) Loss of normal AC power
- (4) Failure of battery charger
- (5) Low-battery capacity

The integrity of the circuit monitoring signal booster(s) and power supply shall comply with applicable codes and standards adopted and/or enforced by the Department of Permits and Inspections.

The main fire alarm system shall monitor and annunciate trouble and supervisory signals (as appropriate) for The System.

System circuit disconnection means shall be permanently identified as to its purpose in accordance with the following: "EMERGENCY COMMUNICATIONS."

Circuit disconnecting means shall be accessible only to authorized personnel.

Have all certified professional engineer (credentialed as specified in this document) approved inspection reports shall remain on site and available for receipt by the Department of Permits and Inspections Fire Alarm Inspector at the time of Department of Permits and Inspection. All acceptance reports shall be provided to inspector prior to final system approval.

TESTING PROCEDURE meeting current NFPA 72 and NFPA 1221 Standards

The test plan must ensure testing throughout the building. Test procedures must be as directed by the design professional and the authority having jurisdiction (AHJ). Using the Frederick County radio channel designated by the Frederick County Emergency Communications Center, each floor must be RF (radio frequency) signal level mapped utilizing a calibrated, portable spectrum analyzer or other testing equipment approved by Frederick County Department of Permits and Inspections. Each floor must be divided into equal grids of no larger than 25' by 25'. Individual testing points must not be spaced greater than 50' apart. Each grid must meet the required signal strength level and provide a Delivered Audio Quality (DAQ) of not less than 3.4. (DAQ 3.4 is defined as "Speech understandable without repetition. Some noise/distortion.") A maximum of 2 non-adjacent grids will be permitted to fail on the same floor. Failure of any 2 adjacent grids is considered a failure for the entire floor. Critical rooms, including but not limited to, such areas as fire command/control center, fire pump room, emergency generator room, stairwells with standpipes, and other staging areas as identified by the AHJ, must not fail coverage at all.

The design and acceptance testing of the in-building public safety radio enhancement system must be performed under the supervision of a State of Maryland registered professional engineer with a minimum of 5 years of experience in the design, installation and alignment of these types systems.

The building owner must maintain a service contract for emergency repair of the system. The service contract must be such that telephone support is available within 2 hours and, on-site maintenance can be provided within 24 hours of recognition that the in-building public safety radio enhancement system is not operating correctly. A copy of that contract must be submitted to the AHJ at the time of acceptance testing. If the service contract is terminated, both the building owner and the contractor must notify the AHJ within 24 hours.

7.0 Responsibilities

7.1 To amplify the signals inside a building or structure not meeting the standards specified in this document, the owner of the building shall be responsible for the installation of an FCC acceptable DAS, Bi-Directional Amplifier/ Emergency Responder Radio Communications Enhancement System (ERRCES)/ Two-way Radio Enhancement Communication System.

7.2 The building owner is responsible for obtaining the services of a Maryland registered professional engineer or designee meeting the requirements of section 5.2 of this document to evaluate and test the signal coverage in the building and to design and install The System..

7.3 New and Existing Building Construction

7.3.1 The installation of The System in a new building shall comply with all state and local building codes including the standards of NFPA, the NEC and the FCC.

7.3.2 A two-inch conduit shall be provided vertically from the roof level to the lowest level of the structure. This conduit will provide a vertical path (Spine or Backbone) for cable to all levels and shall pass through the BDA equipment room. A minimum 20 Amp AC dedicated circuit shall be provided to power and ground to The System.

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7.3.3 All approved required submittal items shall be provided and retained onsite and be immediately available for review for the Frederick County Fire Inspector or Fire Marshal at any time.

7.4 The system(s) shall be able to be retuned or re-banded to accommodate and band changes due to requirements of Frederick County Emergency Communications division and/or FCC regulation changes.

7.5 Secondary Power shall be provided to the system(s) for a minimum of 12 hours by battery and be capable of providing power to the system at 100% capacity use.

7.6 System design and testing shall be completed by a Maryland registered professional engineer or designee meeting the requirements of section 5.2 of this document.

7.7 The building owner shall provide radio coverage testing annually to ensure that the system(s) continues to meet and comply with minimum applicable standards and requirements.

7.1.2 The building owner is responsible for the continued performance and maintenance of the BDA system. The building owner or designee shall have the contact information a licensed contractor that can provide emergency services (in not more than 2 hours) if the system is not operating correctly.

7.1.3 Emergency service personnel shall, with notification and no disruption of processes, have the right to enter the property to conduct field testing to be certain that the required coverage is maintained. The Division of Fire and Rescue Services of Frederick County and the Frederick County Fire Marshal's office shall have the responsibility of surveying existing buildings meeting the requirements of this policy for compliance of adequate emergency radio communications from within those buildings.

7.8 The building owner is responsible for all costs of the installation, operation, maintenance, and infrastructure of the system(s).

7.8.1 Prior to issuance of an occupancy certificate a Maryland registered professional engineer meeting the requirements of section 5.2 of this document shall certify that the building achieves all required levels of radio coverage. This certification shall be submitted to the Frederick County Department of Permits and Inspections upon completion of the job.